

Publication number 2001·205933

HEAT SENSITIVE RECORDING BODY

[Claim(s)]

[Claim 1]In a thermal recording body which has a heat-sensitive recording layer which contains leuco dye, a coloring agent, and adhesives in one field of a base material, A thermal recording body which has an ink-jet-recording layer which contains paints and ionicity resin in a field of another side of a base material, and is characterized by coefficients of static friction between a field by the side of a heat-sensitive recording layer and an ink-jet-recording stratification plane being 0.3·0.7.

[Claim 2]The thermal recording body according to claim 1 which talc contained as paints in an ink-jet-recording layer.

[Claim 3]The thermal recording body according to claim 2 whose talc is 50 to 95 % of the weight to total solids of an ink-jet-recording layer.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the thermal recording body which has ink jet recording suitability at the rear face about the thermal recording body using the coloring reaction of leuco dye and a coloring agent.

[0002]

[Description of the Prior Art] The thermal recording body using the coloring reaction of leuco dye and a coloring agent is known well. Since it is comparatively cheap, and a recording device is compact and maintenance is also easy, such a thermal recording body is used for recording media, such as a facsimile and various computers. The thermal recording body which it not only can record the managed information on the heat-sensitive recording layer side of a thermal recording body by development of information processing technique or a thermal recording system, but can record information on the rear face side which does not have a heat-sensitive recording layer by other systems is demanded.

[0003] The thermal recording body which provided the layer which uses paints and adhesives as the main ingredients in order to improve note nature, a printability, etc. to the rear-face side of a thermal recording body For example, JP,63·268126,A, Although indicated to JP,1·11884,A, JP,4·348987,A, etc., the record density of a thermal recording part falls temporally, or some which ground fogging generates are in a heat-sensitive recording layer.

[0004] By the way, the thermal recording body which provided the conductive layer containing conductive compounds, such as cationic resin, in the rear face of the thermal recording body in order to lessen influence on the humidity at the time of record, Although indicated to JP,57·156292,A, JP,1·11883,A, and JP,5·301457,A, there is a problem in ink jet recording suitability.

[0005]

[Problem(s) to be Solved by the Invention] There is a technical problem of this invention in providing the thermal recording body excellent in ink jet recording suitability and record performance traverse.

[0006]

[Means for Solving the Problem] In a thermal recording body which has a heat-sensitive recording layer which contains leuco dye, a coloring agent, and adhesives in one field of a base material, A coefficient of static friction between a field by the side of ink jet

recording layer **** which contains paints and ionicity resin in a field of another side of the base material, and a heat-sensitive recording layer, and an ink-jet-recording stratification plane is set to 0.3·0.7.

[0007]

[Embodiment of the Invention] This invention is characterized by the coefficients of static friction between the field by the side of the heat-sensitive recording layer in one field of a base material and the ink-jet-recording stratification plane in the field of another side being 0.3·0.7 (value by the level method of JIS P8147), If a coefficient of static friction becomes less than 0.3, a thermal recording body will be set to a printer with a roll or a sheet, When paper is fed using an auto-feed function, it slides too much, and misfeed occurs, and there is a possibility that it may stop sending a thermal recording body when 0.7 is exceeded, and double feed may be carried out, and 0.4·0.6 are more preferred. In particular, the feeding nature to a rolled form thermal recording body is improved. The field by the side of the heat-sensitive recording layer in one field of a base material is a top layer side in one field of a base material. For example, the following heat-sensitive recording layer or a protective layer may be equivalent to the top layer.

[0008] As a means which sets a coefficient of static friction to 0.3·0.7, For example, although the method of carrying out data smoothing or adding lubricant, such as calcium stearate and zinc stearate, in an ink-jet-recording layer according the ink-jet-recording stratification plane side to a super calender is after ink-jet-recording stratification plane formation, This disposal method has a possibility of reducing the ink competence of an ink-jet-recording layer depending on the case (for example, when strengthening super calender processing too much).

[0009] As a means which sets a coefficient of static friction to 0.3·0.7 without reducing the ink competence of an ink-jet-recording layer, for example, an ink-jet-recording layer and/or the top layer by the side of a heat-sensitive recording layer side -- as paints -- primary -- 5 micrometers or less of mean particle diameter of next particle are obtained by making about 1·5·micrometer talc contain preferably. Although not limited especially as amount of the talc used, in the case of an ink-jet-recording layer, it is about 60 to 80 % of the weight more preferably about 50 to 95% of the weight to total solids.

[0010] In an ink-jet-recording layer and the top layer, in addition to the above-mentioned talc, for example Aluminum silicate, Precipitated calcium carbonate, heavy calcium carbonate, a calcium silicate, aluminium hydroxide, Although organic colors, such as inorganic pigments, such as zeolite, calcination clay, kaolin, amorphous silica, a zinc oxide, a titanium dioxide, and barium sulfate, and a styrene resin filler, the Nylon filler

urea-formaldehyde-resin filler, and raw starch, can also be made to contain. When talc does not contain in the ink jet layer, as other paints, amorphous silica is preferred.

[0011]the ionicity resin contained in an ink-jet-recording layer -- carrying out. For example, polyethyleneimine, polyvinyl pyridine, poly dialkylamino ethyl methacrylate, Poly dialkylamino ethyl acrylate, poly dialkylamino ethylmethacrylamide, Poly dialkylamino ethylacrylamide, polyepoxyamine, Polyamide amine, dicyandiamide formalin condensate, a dicyandiamide poly alkyl polyalkylene polyamine condensate, Polydiallyldimethylammoniumchloride, polyvinyl amine, Polyallylamine, an acrylamide diaryl amine salt acid chloride copolymer, Cationic resin, such as a dimethylamine epichlorohydrin polycondensation thing, and polystyrene sulfonate, The anionic resin which consists of salts, such as sodium, such as polyacrylic acid, a styrene maleic anhydride copolymer, and an ethylene maleic anhydride copolymer, potassium, and ammonium, is mentioned.

[0012]Especially, when the ink of an ink jet is anionic, especially polymer or the copolymers that have quarternary-ammonium-salt groups, such as a salt of polydiaryl methylammonium, such as acrylate, methacrylate, and acrylamide, are excellent in the ink fixability of an ink-jet-recording part, and preferred.

[0013]Although the amount in particular of this ionicity resin used is not limited, its about 1 to 50 % of the weight is preferred to an ink-jet-recording layer. It is about 1 to 30 % of the weight more preferably.

[0014]Generally through water an ink-jet-recording layer Paints and cationic resin, The coating liquid for ink-jet-recording layers produced by carrying out mixed stirring of the adhesives as occasion demands And air knife coating, BARIBA braid coating, pure braid coating, BIRUBUREDO coating, Rod braid coating, short dwelling coating, curtain coating, coating methods, such as die coating, -- the coverage after drying at the rear face of a base material -- a 1 · 20 g/m² grade -- spreading desiccation is carried out and it is formed so that it may become a 2 · 15 g/m² grade preferably.

[0015]If the coverage of an ink-jet-recording layer becomes less than 1 g/m², the water resisting property of recording image quality and the Records Department will fall, and when 20 g/m² is exceeded, there is a possibility that an ink-jet-recording layer may separate easily, and it may fall, or may be generated by the **** ball for a head nozzle at the time of ink jet recording.

[0016]As adhesives contained as occasion demands in the coating liquid for ink-jet-recording layers, For example, full saponification polyvinyl alcohol, partial saponification polyvinyl alcohol, Carboxy denaturation polyvinyl alcohol, acetoacetyl modified polyvinyl alcohol, Diacetone modified polyvinyl alcohol, silicon denaturation

polyvinyl alcohol, Cationic latex of starch, an oxidized starch, cation denaturation starch, hydroxyethyl cellulose, methyl cellulose, carboxymethyl cellulose, gelatin, casein, gum arabic, acrylic, or a vinyl acetate system, etc. are mentioned.

[0017] Especially, since the intensity of an ink-jet-recording layer can be raised without reducing the rate of absorption of a water-based ink, silicon denaturation polyvinyl alcohol is used preferably.

[0018] Although not limited in particular for the amount of the adhesives used, it is about 5 to 40 % of the weight to an ink-jet-recording layer.

[0019] In the coating liquid for ink-jet-recording layers, a pigment agent, a defoaming agent, a coloring color, fluorescent dye, an antioxidant, an ultraviolet ray absorbent, a viscosity controlling agent, a cross linking agent, etc. are added further suitably.

[0020] Although not limited in this invention especially as the leuco dye contained in the heat-sensitive recording layer formed on the surface of a base material, and a coloring agent, the following are mentioned, for example. As an example of leuco dye, for example 3-diethylamino 6-methyl-7-anilinofluoran, 3-JI (n-butyl) amino-6-methyl-7-anilinofluoran, 3-JI (n-pentyl) amino-6-methyl-7-anilinofluoran, 3-JI (n-butyl) amino-7-(o-chlorophenylamino) fluoran, 3-diethylamino 7-(o-fluorophenylamino) fluoran, 3-(N-ethyl-p-toluidino)-6-methyl-7-anilinofluoran, 3-(N-ethyl-N-isoamylamino)-6-methyl-7-anilinofluoran, 3-(N-methyl-N-cyclohexyl) amino-6-methyl-7-anilinofluoran, 3-(N-ethyl-N-isobutyl) amino-6-methyl-7-anilinofluoran, Black color-enhancing colors, such as 3-pyrrolidino 6-methyl-7-anilinofluoran, 3-piperidino 6-methyl-7-anilinofluoran, and 3-diethylamino 7-(3'-trifluoro methylphenyl) aminofluoran, [0021]3 and

3-bis(p-dimethylaminophenyl)-6-dimethylamino phthalide, 3-(4-diethylamino 2-methylphenyl)-3-(4-dimethylaminophenyl)-6-dimethylamino phthalide, 3-diethylamino 7-***** [a]Blue color-enhancing colors, such as fluoran, 3-(N-ethyl-N-p-tolyl) amino-7-N-methylanilinofluoran, Green color-enhancing colors, such as 3-diethylamino 7-anilinofluoran and 3-diethylamino 7-dibenzylamino fluoran, 3, 3'-bis(4-diethylamino 2-ethoxyphenyl)-4-azaphthalide, 3,6-bis(diethylamino)fluoran gamma-anilinolactam, 3-cyclohexylamino 6-chlorofluoran, 3-diethylamino 6-methyl-7-chlorofluoran, Red color nature colors, such as 3-diethylamino 7-chlorofluoran and 3-diethylamino 6,8-dimethylfluoran, 3,7-bis(dimethylamino)-10-benzoylphenothiazin, a 3,3-screw [1-(4-methoxyphenyl)-1-(4-dimethylaminophenyl) ethylene-2-yl] -4,5,6,7-tetrachlorophthalide, a 3,3-screw [1-(4-methoxyphenyl)-1-(4-pyrrolidino phenyl) ethylene-2-yl] -4,5,6,7-tetrachlorophthalide, 3 - [p-(p-anilinoanilino) anilino]

-6-methyl-7-chlorofluoran, 3 [p-(p-dimethylamino anilino) anilino]
 -6-methyl-7-chlorofluoran, 3 [p-(p-dimethylamino anilino) anilino] -6-methylfluoran,
 3,6-bis(dimethylamino)fluorene-9-spiro3'-(6'-dimethylamino) phthalide,
 3'-phenyl-7-N-diethylamino 2,2'-spirodi-(2H-1-benzopyran),
 Bis(p-dimethylaminostyryl)-p-Trisul HONIRU methane, 3-(N-p-tolyl
 N-ethylamino)-6,8,8-trimethyl 9-ethyl-8,9-dihydro-(3, 2e) pyrid fluoran, The color which
 has absorption is mentioned to near infrared regions, such as 3-JI (n-butyl)
 amino-6,8,8-trimethyl 8,9-dihydro-(3, 2e) pyrid fluoran.

[0022] Not the thing limited to these but two or more sorts can also be used together. As amount of this leuco dye used, it is about 5 to 40 % of the weight to a heat-sensitive recording layer. Although a recording image generally has many things of black coloring, as a black color-enhancing color, the influence according [3-JI (n-butyl) amino-6-methyl-7-anilinofluoran] to the concentration of a recording image, sensitivity, preservability, the stability of a non-coloring part, and an ink-jet-recording layer is used preferably few.

[0023] Also when using together the color which has absorption in a near infrared region by development of a semiconductor laser light source reader in recent years, are increasing, but. In this case, 3,7-bis(dimethylamino)-10-benzoylphenothiazin, 3'-phenyl-7-N-diethylamino 2,2'-SUPIROJI (2H-1-benzopyran), a 3,3-screw [1-(4-methoxyphenyl)-1-(4-dimethylaminophenyl) ethylene-2-yl]
 -4,5,6,7-tetrachlorophthalide, 3, 3'-bis(4-diethylamino 2-ethoxyphenyl)-4-azaphthalide, 3-(N-p-tolyl N-ethylamino)-6,8,8-trimethyl 9-ethyl-8,9-dihydro-(3, 2e) pyrid fluoran has absorption strong against a near infrared region, and since the preservability of a recording image is high and is stable, it is used preferably. [of a non-coloring part]

[0024] As a coloring agent, for example The activated clay, attapulgite, amorphous silica, Inorganic acid nature substances, such as aluminum silicate, 4,4'-isopropylidenediphenol, 1,1-bis(4-hydroxyphenyl)cyclohexane, 2,2-bis(4-hydroxyphenyl)-4-methylpentane, A 4,4'-dihydroxydiphenyl sulfide, hydroquinone monobenzyl ether, 4-hydroxybenzyl benzoate, 2,4'-dihydroxybenzophenone, 4,4'-dihydroxy diphenylsulfone, 2,4'-dihydroxy diphenylsulfone, 4-hydroxy-4'-isopropoxy diphenyl sulfone, a bis(3-allyl-4-hydroxyphenyl)sulfone, 4-hydroxy-4'-methyl diphenylsulfone, a 4-hydroxyphenyl 4'-benzyloxyphenyl sulfone, A 3,4-dihydroxyphenyl-4'-methylphenyl sulfone, 2,4-bis(phenyl sulfonyl)phenol, bis(p-hydroxyphenyl)methyl acetate, 1,1-bis(4-hydroxyphenyl)-1-phenylethane, a 1,4-screw [alpha-methyl-alpha-(4'-hydroxyphenyl) ethyl] Benzene, a 1,3-screw

[alpha-methyl-alpha-(4'-hydroxyphenyl) ethyl] Benzene, a JI (4-hydroxy-3-methylphenyl) sulfide, Phenolic compounds, such as a 2,2'-thioscrew (3-tert-octylphenol), Thiourea compounds, such as N,N'-di-m-chlorophenyl thiourea, N-(p-tolyl sulfonyl) carbamoylacid p-cumyl phenyl ester, N-(p-tolyl sulfonyl) carbamoylacid p-benzyloxyphenyl ester, What has -SO₂ NH-combination in intramoleculars, such as N-(o-toluoyl)-p-tolyl sulfoamide and N-(p-tolyl sulfonyl)-N'-(p-tolyl) urea, zinc para-chlorobenzoate, 4-[2-(p-methoxy phenoxy) ethyloxy] Salicylic acid zinc, 4-[3-(p-tolyl sulfonyl) propyloxy] Salicylic acid zinc, 5-[p-(2-p-methoxy phenoxyethoxy) cumyl] Organic acid nature substances, such as aromatic-carboxylic-acid zinc salt, such as salicylic acid zinc, are mentioned.

[0025]4-hydroxy-4'-isopropoxy diphenyl sulfone especially, A bis(3-allyl-4-hydroxyphenyl)sulfone, 4-hydroxy-4'-methyl diphenylsulfone, A 4-hydroxyphenyl 4'-benzyloxyphenyl sulfone, A 3,4-dihydroxyphenyl-4'-methylphenyl sulfone, 2,4-bis(phenyl slufonyl)phenol, N-(p-tolyl sulfonyl) carbamoylacid p-cumyl phenyl ester, What has a sulfonyl group in molecules, such as N-(p-tolyl sulfonyl) carbamoylacid p-benzyloxyphenyl ester, N-(o-toluoyl)-p-tolyl sulfoamide, and N-(p-tolyl sulfonyl)-N'-(p-tolyl) urea, is preferred. It is preferably used from especially excelling in the general preservability and recording sensitivity of a recording image, when 4-hydroxy-4'-isopropoxy diphenyl sulfone and a bis(3-allyl-4-hydroxyphenyl)sulfone are used.

[0026]Although the use rate of leuco dye and a coloring agent is suitably chosen according to the kind of leuco dye and the coloring agent to be used and is not limited in particular, generally the coloring agent of about 2-6 weight sections is preferably used one to 10 weight section to leuco dye 1 weight section.

[0027]A heat-sensitive recording layer can also be made to contain a sensitizer, in order to improve the preservation stability of the Records Department and to raise a storage stability improvement agent and recording sensitivity. As an example of this storage stability improvement agent, for example A 2,2'-ethylidenescrew (4,6-di-tert-butylphenol), A 4,4'-thioscrew (2-methyl-6-tert-butylphenol), 1,1,3-tris(2-methyl-4-hydroxy-5-tert-buthylphenyl) butane, 1,1,3-tris(2-methyl-4-hydroxy-5-cyclohexylphenyl) butane, Hindered phenolic compounds, such as 2,2-bis(4-hydroxy-3,5-dimethylphenyl)propane, 1,4-diglycidyl oxybenzene, a 4,4'-diglycidyl oxydi phenylsulfone, 4-benzyloxy 4'-(2-methyl glycidyloxy) diphenylsulfone, Terephthalic acid diglycidyl, cresol novolak type epoxy resin, Epoxy compounds, such as phenol novolak type epoxy resin and a bisphenol A type epoxy resin, Sodium of N,N'-di-2-naphthyl p-phenylene diamine and 2,2'-methylenebis

(4,6-di-tert-butylphenyl) phosphate or polyvalent metallic salt, bis(4-ethylene imino carbonylamino phenyl)methane, etc. are mentioned. Although the amount in particular of these storage stability improvement agents used is not limited, it is desirable to adjust by four or less weight sections to coloring agent 1 weight section generally.

[0028]As an example of a sensitizer, for example Octadecanamide, methylenebis octadecanamide, Terephthalic acid dibenzyl, p-benzyloxy benzyl benzoate, 2-naphthyl benzyl ether, m-terphenyl, p-benzylbiphenyl, p-Trilby phenyl ether, JI (p-methoxy phenoxyethyl) ether, 1,2-JI (3-methylphenoxy) ethane, 1,2-JI (4-methylphenoxy) ethane, 1,2-JI (4-methoxy phenoxy) ethane, 1,2-JI (4-chlorophenoxy) ethane, 1,2-diphenoxoethane, 1-(4-methoxy phenoxy)-2-(3-methylphenoxy) ethane, p-methylthio phenylbenzyl ether, 1,4-JI (phenylthio) butane, p-acetotoluidide, p-acetophenetidide, N-acetoacetyl p-toluidine, JI (beta-biphenyl ethoxy) benzene, oxalic acid di-p-chloro benzyl ester, oxalic acid di-p-methylbenzyl ester, oxalic acid dibenzyl ester, etc. are mentioned. Although the amount in particular of these storage stability improvement agents and the sensitizer used is not limited, it is desirable to adjust by four or less weight sections to coloring agent 1 weight section generally.

[0029]A heat-sensitive recording layer uses water or an organic solvent as a carrier fluid object, and Leuco dye, a coloring agent, A storage stability improvement agent etc. both or independently by a sensitizer and necessity A ball mill, After carrying out micro-disperse so that 3 micrometers or less of mean particle diameter may be preferably set to 2 micrometers or less with stirring and grinders, such as attritor and a sand mill, spreading desiccation of the coating liquid for heat-sensitive recording layers which added adhesives at least and was prepared is carried out in one field (surface) of a base material, and it is formed.

[0030]As an example of the adhesives added in the coating liquid for heat-sensitive recording layers, For example, starch, hydroxyethyl cellulose, methyl cellulose, Carboxymethyl cellulose, gelatin, casein, gum arabic, Polyvinyl alcohol, carboxy denaturation polyvinyl alcohol, acetoacetyl modified polyvinyl alcohol, Silicon polyvinyl alcohol, diisobutylene and a maleic anhydride copolymer salt, A styrene maleic anhydride copolymer salt, an ethylene acrylic acid copolymer salt, a styrene acrylic acid copolymer salt, urea resin, melamine resin, amide resin, urethane resin system latex, acrylic resin system latex, styrene butadiene resins system latex, etc. are mentioned. As amount of the adhesives used, it is about 5 to 35 % of the weight to the total solids of a heat-sensitive recording layer.

[0031]In the coating liquid for heat-sensitive recording layers, various kinds of auxiliary agents can be added if needed, For example, sodium dioctyl sulfosuccinate, sodium

dodecylbenzenesulfonate, Waxes, such as dispersing agents, such as lauryl alcohol sulfuric acid ester sodium and fatty acid metal salt, zinc stearate, calcium stearate, polyethylene wax, Kalna Barrow, paraffin wax, and ester wax, a defoaming agent, a coloring color, etc. are added suitably.

[0032]It is also possible to use together various paints other than talc in the coating liquid for heat-sensitive recording layers, For example, kaolin, clay, calcium carbonate, calcination clay, calcination kaolin, Organic colors, such as inorganic pigments, such as titanium oxide, diatomaceous earth, particle-like anhydrous silica, and activated clay, a styrene micro ball, nylon powder, polyethylene powder, an urea-formaldehyde-resin filler, and a raw starch grain child, etc. are mentioned.

[0033]On a heat-sensitive recording layer, the adhesives which have membrane formation nature, and the protective layer containing paints are provided as occasion demands. As the adhesives contained in this protective layer, and paints, what is added in the above-mentioned coating liquid for heat-sensitive recording layers, for example besides talc is mentioned. As amount of adhesives and the paints used, it is about 10 to 95 % of the weight to the total drained weight of a protective layer, respectively. The auxiliary agent which can be added in the above-mentioned coating liquid for heat-sensitive recording layers if needed can also be made to contain in a protective layer.

[0034]A heat-sensitive recording layer and a protective layer, for example Air knife coating, BARIBA braid coating, With coating methods, such as pure braid coating, rod braid coating, short dwelling coating, curtain coating, and die coating. Spreading desiccation of the coating liquid for heat-sensitive recording layers and the coating liquid for protective layers is carried out one by one, and it is formed in the surface of base materials, such as paper (acid paper, alkaline paper), a plastic film, a synthetic paper, a nonwoven fabric, and a metal deposition thing.

[0035]the coverage of the coating liquid for heat-sensitive recording layers -- dry weight -- 2 · 12 g/m² -- it is a 3 · 10 g/m² grade preferably -- the coverage of the coating liquid for protective layers -- dry weight -- 0.1 · 20 g/m² -- it is a 0.5 · 10 g/m² grade preferably.

[0036]In order to raise recording sensitivity and recording image quality, it is possible to provide the under coat which used oil-absorption-property paints or an empty capsid as the main ingredients between a base material and a heat-sensitive recording layer, or to perform data smoothing, such as super calender credit, after the class smear etc. Various kinds of known art in other thermal recording body manufacturing fields can add if needed.

[0037]

[Example] Although an example is given to below and this invention is more concretely explained to it, of course, it is not limited to these. Especially the "part" in an example, and "%", unless it refuses, a "weight section" and "% of the weight" are shown, respectively.

[0038] Preparation calcination clay of the coating liquid for example 1 ** under coats [oil absorption: 90·ml/100g] Mixed stirring of the constituent which consists of 200 copies of 10% solution and 100 copies of water of 100 copies and polyvinyl alcohol (the saponification degree %, the degree of polymerization 1000 of 98 mol) was carried out, and the coating liquid for under coats was obtained.

[0039]** The constituent which consists of five copies of 5% solution and 25 copies of water of ten copies of A liquid preparation 3-di-(n-butyl) amino-6-methyl-7-anilinofluoran and methyl cellulose was ground until mean particle diameter was set to 1.0 micrometer by the sand mill, and A liquid was obtained.

[0040]** The constituent which consists of 15 copies of 5% solution and 75 copies of water of 30 copies of B liquid preparation 4-hydroxy-4'-isopropoxy dienyl sulfones and methyl cellulose was ground until mean particle diameter was set to 1.0 micrometer by the sand mill, and B liquid was obtained.

[0041]** The constituent which consists of ten copies of 5% solution and 50 copies of water of 20 copies of C fluid preparation 1,2-JI (3-methylphenoxy) ethane and methyl cellulose was ground until mean particle diameter was set to 1.0 micrometer by the sand mill, and C fluid was obtained.

[0042]** 20 copies of styrene butadiene series latex of 40 copies of preparation A liquid of the coating liquid for heat-sensitive recording layers, 120 copies of B liquid, 80 copies of C fluid, 160 copies of 10% solution of full saponification polyvinyl alcohol, two copies of 40% solution of glyoxal, and 50% of solid concentration, and calcium carbonate [trade name: SOFUTON 1500,] by a *****-ized company Mixed stirring of the 17 copies was carried out, and the coating liquid for heat-sensitive recording layers was obtained.

[0043]** 250 copies of 10% solution of preparation acetoacetyl modified polyvinyl alcohol of the coating liquid for protective layers, kaolin [trade name: UW-90 and ene gel hard company make] 60 copies, talc [trade name: 952, the mean particle diameter of 3.7 micrometers, the oil absorption of 54 ml/100 g,] by the KANEMATSU coal chemical product company Mixed stirring of the constituent which consists of ten copies, one copy of 30% solution of polyamide epichlorohydrin, six copies of 30% water dispersions of zinc stearate, and 150 copies of water was carried out, and the coating liquid for protective layers was obtained.

[0044]** Preparation silicon denaturation polyvinyl alcohol of the coating liquid for

ink-jet-recording layers [trade name: R-1130, 420 copies of 5% solution of] by Kuraray Co., Ltd., talc [trade name: 952, the mean particle diameter of 3.7 micrometers, the oil absorption of 54 ml/100 g,] by the KANEMATSU coal chemical product company 60 copies, water-soluble poly cationic resin [trade name: The jet fix 50S, 26 copies of 50% solution of] by Satoda Kako, Ltd., cationic vinyl-acetate-resin system latex [trade name: Mixed stirring of the constituent which consists of 13 copies of 45% moisture liquid of YODOZORU CE-58 and] by a Kanebo N.S.C company was carried out, and the coating liquid for ink-jet-recording layers was obtained.

[0045]To one field of production neutral paper of fine quality 40 g/m² of a thermal recording body, ** The coating liquid for under coats, The coverage after drying the coating liquid for thermal layers and the coating liquid for protective layers, respectively 7 g/m², After carrying out spreading desiccation and providing an under coat, a heat-sensitive recording layer, and a protective layer one by one so that it may become 6 g/m² and 4 g/m², spreading desiccation was carried out and the thermal recording body was obtained so that the coverage after drying the coating liquid for ink-jet-recording layers to the field of another side might serve as 10 g/m². (After providing an under coat, a heat-sensitive recording layer, and a protective layer, super calender processing was carried out, respectively.)

[0046]In preparation of the coating liquid for ink-jet-recording layers of example 2 Example 1, it is talc instead of 60 copies of talc. [trade name: SG2000, the mean particle diameter of 4.2 micrometers, the oil absorption of 66 ml/100 g,] by a Japanese talc company The thermal recording body was obtained like Example 1 except having used 60 copies.

[0047]In preparation of the coating liquid for ink-jet-recording layers of example 3 Example 1, it is talc instead of 60 copies of talc. [trade name: High micron HE-5, the mean particle diameter of 1.6 micrometers, the oil absorption of 50 ml/100 g,] by the Takehara chemicals company The thermal recording body was obtained like Example 1 except having used 60 copies.

[0048]In preparation of the coating liquid for ink-jet-recording layers of example 4 Example 1, they are 40 copies of the talc, and amorphous silica instead of 60 copies of talc. [trade name: The nip seal E-743,] by a Japanese silica industrial company The thermal recording body was obtained like Example 1 except having used 20 copies.

[0049]In production of the thermal recording body of example 5 Example 1, the thermal recording body was obtained like Example 1 except not having provided a protective layer.

[0050]In preparation of the coating liquid for heat-sensitive recording layers of example

6 Example 1, it is talc instead of 17 copies of calcium carbonate. [trade name: 952, the mean particle diameter of 3.7 micrometers, the oil absorption of 54 ml/100 g.] by the KANEMATSU coal chemical product company In production of a thermal recording body, the thermal recording body was obtained like Example 1 using 17 copies except not having provided a protective layer.

[0051]In preparation of the coating liquid for protective layers of example 7 Example 1, they are 40 copies of the kaolin, and amorphous silica instead of 60 copies of kaolin. [trade name: Ms. KASHIRU P-527.] by the Mizusawa chemical industry company The thermal recording body was obtained like Example 1 except having used 20 copies.

[0052]In preparation of the coating liquid for protective layers of example 8 Example 1, it is kaolin instead of ten copies of talc. [trade name: UW-90 and ene gel hard company make] The thermal recording body was obtained like Example 1 except having used ten copies.

[0053]In production of the thermal recording body of example 9 Example 1, the thermal recording body was obtained like Example 1 except having made 10g/m² of coverage after desiccation of the coating liquid for ink-jet-recording layers into 2 g/m².

[0054]The thermal recording body was obtained like Example 1 except having used the following coating liquid for ink-jet-recording layers instead of the coating liquid for ink-jet-recording layers used in production of the thermal recording body of example 10 Example 1.

[0055]- Preparation silicon denaturation polyvinyl alcohol of the coating liquid for ink-jet-recording layers [trade name: R-1130, 220 copies of 5% solution of] by Kuraray Co., Ltd., talc [trade name: 952, the mean particle diameter of 3.7 micrometers, the oil absorption of 54 ml/100 g.] by the KANEMATSU coal chemical product company 80 copies, water-soluble poly cationic resin [trade name: The jet fix 50S, 12 copies of 50% solution of] by Satoda Kako, Ltd., cationic vinyl-acetate-resin system latex [trade name: Mixed stirring of the constituent which consists of seven copies of 45% moisture liquid of YODOZORU CE-58 and] by a Kanebo N.S.C company was carried out, and the coating liquid for ink-jet-recording layers was obtained.

[0056]In preparation of the coating liquid for protective layers of example 11 Example 1, it is amorphous silica instead of 60 copies of kaolin, and ten copies of talc. [trade name: Ms. KASHIRU P-527.] by the Mizusawa chemical industry company In production of a thermal recording body, to one field of neutral paper-of-fine-quality 40 g/m², using 70 copies The coating liquid for under coats, The coverage after drying the coating liquid for thermal layers, the following coating liquid for interlayers, and the coating liquid for protective layers, respectively 7 g/m², The thermal recording body was obtained like

Example 1 except ***** after the desiccation which carried out spreading desiccation and provided the under coat, the heat-sensitive recording layer, the interlayer, and the protective layer one by one so that it might become 6 g/m², 2 g/m², and 1 g/m².

[0057]- 100 copies of 10% solution of preparation acetoacetyl modified polyvinyl alcohol of the coating liquid for interlayers, talc [trade name: 952 and KANEMATSU coal chemical product company make] 50 copies, acrylic latex [trade name: Polysol AM2250, 52% of solids concentration,] by Showa High Polymer Co., Ltd. Mixed stirring of the constituent which consists of six copies of 30% dispersion liquid and 100 copies of water of 70 copies and zinc stearate was carried out, and the coating liquid for interlayers was obtained.

[0058]In preparation of the coating liquid for ink-jet-recording layers of example 12 Example 1, they are ten copies of the talc, and amorphous silica instead of 60 copies of talc. [trade name: The nip seal E-743,] by a Japanese silica industrial company The thermal recording body was obtained like Example 1 except having used 50 copies.

[0059]In preparation of the coating liquid for ink-jet-recording layers of comparative example 1 Example 1, it is kaolin instead of 60 copies of talc. [trade name: UW-90 and ene gel hard company make] The thermal recording body was obtained like Example 1 except having used 60 copies.

[0060]In preparation of the coating liquid for protective layers of comparative example 2 Example 1, it is talc instead of 60 copies of kaolin. [trade name: The thermal recording body was obtained like Example 1 except having used high micron HE-5, the mean particle diameter of 1.6 micrometers, the oil absorption of 50 ml/100 g, 52% of solids concentration, and] by the Takehara chemicals company.

[0061]In preparation of the coating liquid for ink-jet-recording layers of comparative example 3 Example 1, it is amorphous silica instead of 60 copies of talc. [trade name: The nip seal E-743,] by a Japanese silica industrial company In preparation of the coating liquid for protective layers, it is amorphous silica instead of 60 copies of kaolin, and ten copies of talc, using 60 copies. [trade name: Ms. KASHIRU P-527,] by the Mizusawa chemical industry company The thermal recording body was obtained like Example 1 except having used 70 copies.

[0062]About the thermal recording body obtained in this way, the following evaluation tests were done and the result was shown in Table 1.

[Evaluation]

[Ink jet recording suitability] Ink-jet-recording machine [trade name: It is black ink to color image jet IO735X and] by a sharp company. [trade name: Load with SAITEKKUSU#1007 and] by psytic SUJAPAN, make each thermal recording body rear

face carry out ink jet recording, and it is the Macbeth densimeter about the concentration of the Records Department. It measured in the visual mode [RD-914 type and made in Macbeth]. The thermal recording body 5 minutes after ink jet recording was dipped in 25 ** water for 10 seconds, and visual evaluation of the Records Department after natural seasoning was carried out on the following standard.

O : the flow of ink is not accepted at all.

O : the flow of ink is accepted slightly.

[0063][Printer feeding nature] High-speed fax [trade name: The generating grade of the misfeed to which paper cannot be fed because of a paper slide, and the double feed which feeds paper to two or more sheets was evaluated as feeding nature using UF60 H-X and] by the Matsushita electrical transmission company. It was evaluated as follows whether it has conveyed smoothly per 50 feed number of sheets.

O : misfeed and double feed do not occur at all.

O : misfeed and double feed carry out small generating.

x: Misfeed and double feed occur mostly.

[0064][Measurement of a coefficient of static friction] a coefficient of static friction applies to JIS P-8147 correspondingly -- the table of a thermal recording body -- back (table-reverse side) -- it measured.

[0065][thermal recording concentration] Thermal recording evaluator [trade name: It is the Macbeth densimeter using TH-PMD and] by the Okura electrical machinery company about the recording image which made each thermal recording body color in applied energy:0.35 mJ/dot, and was acquired. It measured in the visual mode [RD-914 type and made in Macbeth].

[0066]

[Table 1]

	インクジェット記録層			最上層		摩擦係数	プリンタ 搬送性	インクジェット記録濃度	記録部の 耐水性	感熱記録 濃度
	塗布量	タルク含有量	その他顔料	タルク含有量	その他顔料					
実施例1	10g	60%		10%	カオリン60%	0.42	◎	1.15	○	1.24
実施例2	10g	60%		10%	カオリン60%	0.45	◎	1.20	○	1.21
実施例3	10g	60%		10%	カオリン60%	0.40	◎	1.17	○	1.25
実施例4	10g	40%	シリカ20%	10%	カオリン60%	0.53	○	1.30	○	1.24
実施例5	10g	60%		0%	なし	0.48	◎	1.15	○	1.32
実施例6	10g	60%		17%	なし	0.42	◎	1.15	○	1.35
実施例7	10g	60%		10%	カオリン,シリカ	0.52	◎	1.15	○	1.22
実施例8	10g	60%		0%	カオリン70%	0.45	◎	1.15	○	1.25
実施例9	2g	60%		10%	カオリン60%	0.42	◎	1.12	○	1.24
実施例10	10g	80%		10%	カオリン60%	0.40	◎	1.17	○	1.24
実施例11	10g	60%		0%	シリカ70%	0.55	◎	1.15	○	1.21
実施例12	10g	10%	シリカ50%	10%	カオリン60%	0.64	○	1.25	◎	1.24
実施例13	10g	0%	シリカ60%	70%	なし	0.53	◎	1.30	◎	1.22
比較例1	10g	60%		70%	なし	0.25	×	1.15	○	1.22
比較例2	10g	0%	シリカ60%	0%	シリカ70%	0.73	×	1.30	◎	1.14

[Effect of the Invention]It is a thermal recording body which is excellent in ink-jet-recording nature, and moreover has an effect with little misfeed and double feed at the time of feeding using an auto-feed function so that clearly from the result of

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a heat sensitive recording body excellent in ink jet recordability and record runnability.

SOLUTION: In a heat sensitive recording body having a heat sensitive recording layer including a leuco dye, a colorant and an adhesive on one side of a support, an ink jet recording layer including a pigment and an ionic resin is provided on the other side of the support. At the same time, the static frictional coefficient between the surface on the heat sensitive recording layer side and the ink jet recording layer is set to be 0.3 to 0.7.